

SUPPORT FOR THE AMENDMENTS

Support for the amendment of Claim 1 is found in Claim 2.

Claims 6 and 10 are amended to correct clerical errors made in previous amendments.

No new matter is believed added to this application by entry of this amendment.

Upon entry of this amendment, Claims 1-2 and 4-15 are active.

REMARKS/ARGUMENTS

The claimed invention is directed to a process for preparing dinitrotoluene, comprising:

- a) reacting toluene with nitric acid in the presence of sulfuric acid to give a mononitrotoluene reaction mixture;
- b) separating the mononitrotoluene reaction mixture from a) in a dynamic separator into an organic phase comprising mononitrotoluene and an aqueous phase comprising sulfuric acid;
- c) reacting the organic phase comprising mononitrotoluene with nitric acid in the presence of sulfuric acid to give a dinitrotoluene reaction mixture; and
- d) separating the dinitrotoluene reaction mixture from c) into an organic phase comprising dinitrotoluene and an aqueous phase comprising sulfuric acid;

wherein the mononitrotoluene reaction mixture from a) has a **content of toluene of 3.5 to 8% by weight**, based on the organic phase, and a content of nitric acid of from 0.1 to 1.2% by weight, based on the aqueous phase, and the phase separation in b) is effected in such a way that further reaction of the toluene with the nitric acid is prevented.

Contrary to conventional wisdom, Applicants have discovered that DNT can be prepared by a method wherein a much higher amount of unreacted toluene can be allowed at the separation of the phases following mononitration (3.5 to 8% by weight of the organic

phase) if the phase separation is effected in such a way that further reaction of the toluene with nitric acid is prevented. Specifically, the separation is carried out in a dynamic separator which is distinguished from a conventional static separator wherein the phases are allowed to separate by gravity. No such process is disclosed or suggested in the cited references.

Applicants wish to thank Examiner Brooks and Examiner Sullivan for the useful and courteous discussion of the above-identified application with Applicants' U.S. representative on May 18, 2010. At that time, the basic objective of the present invention was reviewed and discussed. Applicants' U.S. representative showed that none of the cited references were directed to separation of the mononitration reaction mixture while significant amounts of toluene and nitric acid remained present. Amendment to the claims to accurately describe the invention was discussed, especially with regard to the numeric description of the content ranges for toluene and nitric acid. The following reiterates and expands upon that discussion.

Applicants respectfully note that Claim 1 is herein amended to recite that the content of toluene in the organic phase when separation of the mononitration mixture is effected is **3.5-8%.**

The rejection of Claims 1, 2-11 and 13-15 under 35 U.S.C. 103(a) over Sawicki (U.S. 4,367,347) in view of Herman et al. (Industrial Nitration of Toluene to Dinitrotoluene) is respectfully traversed.

Sawicki describes a two stage nitration of toluene, wherein at the completion of the mononitration stage, the organic and aqueous acid phases are allowed to separate by gravity (Col. 5, lines 36-42). Sawicki describes that the spent acid contains 0.1 to 1.0 wt % nitrous and nitric acid the organic phase may contain about 0.5% unreacted toluene(Col. 5, lines 43-45). Sawicki provides no experimental description of a mononitration system. However, Applicants submit that the reference clearly points to conventionally low levels of toluene

and does not disclose or suggest opposing conventional wisdom by allowing comparatively high levels of 3.5 to 8% by weight toluene, as according to the present invention.

Hermann is cited to show the use of a dynamic separator in nitration of toluene.

However, this reference describes the conventional process for nitration and nowhere discloses or suggests separation of the aqueous and organic phases while 3.5% or more of toluene remains in the presence of reactive amounts of nitric acid.

In discussion of “**Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.***” the Office has stated:

“The rationale to support a conclusion that the claim would have been obvious is that **all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention. “[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art,**” (Federal Register, Vol. 72, No. 195, page 57529) (Bold added)(Citations omitted)

As described above, Applicants submit that the combined descriptions of Sawicki and Hermann do not disclose or suggest separation of the toluene mononitration mixture when 3.5- 8% unreacted toluene and nitrating nitric acid are present. Accordingly the cited reference combination does not make all the claimed elements known and a conclusion of obviousness cannot be supported. Applicants respectfully request that the rejection of Claims 1, 2-11 and 13-15 under 35 U.S.C. 103(a) over Sawicki in view of Herman be withdrawn.

The rejection of Claim 12 under 35 U.S.C. 103(a) over Sawicki in view of Herman and further in view of Klingler et al. (U.S. 5,689,018) is respectfully traversed.

Applicants note that Claim 12 depends directly from Claim 1 and includes all the description of the independent claim. The deficiency of the primary reference combination is described above. Klingler does not cure that deficiency.

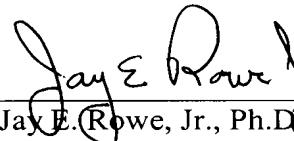
Klingler describes nitration of toluene in two distinct stages. Stage 1 is an isothermal reaction (Claim 1) and Stage 2 is adiabatic. Each stage contains separate acid cycles (Col. 4, lines 40-42 and 50-53) and therefore the process described is not of counter current nature with respect to spent acid recycle as is the case with the present application and with Sawicki. The secondary reference does not disclose or suggest the use of a dynamic separator, unconventionally high amounts of unreacted toluene in the organic phase following mononitration and does not disclose or suggest effecting the separation of the organic and acid phases following mononitration in such a way that further reaction of the toluene with the nitric acid is prevented. Therefore, the secondary reference does not provide the description lacking in the primary reference.

Therefore, Applicants respectfully request that the rejection of Claim 12 under 35 U.S.C. 103(a) over Sawicki in view of Herman and further in view of Klingler be withdrawn.

Applicants respectfully submit that the above-identified application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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